

Claims

What is claimed is:

1. A bottom plug for use in connection with an apparatus for forming a mono diameter wellbore casing, the apparatus of the type using an expandable tubular member carried into the wellbore on a tubular support and expanded with an expansion cone connected to the tubular support, the bottom plug comprising:

an expandable packer attached below the expansion cone;

a packer setting mechanism coupled between the expansion cone and the expandable packer for expanding the expandable packer and sealingly setting the expandable packer in an expanded portion of the expandable tubular member; and

a release mechanism coupled between the expansion cone and the expandable packer for releasing the expandable bottom packer from the expansion cone so that fluid pumped into the expandable tubular member between the expansion cone and the sealed and set expandable bottom packer will force the expansion cone into and through the expandable tubular member to expand the expandable tubular member.

2. The bottom plug of claim 1, further comprising a closable valve for selectively passing fluidic materials through the expandable packer into the wellbore.

3. The bottom plug of claim 1, wherein the expandable packer comprises a drillable packer.

4. The bottom plug of claim 1, wherein the expandable packer comprises a retrievable packer.

5. An apparatus connectable to a drill pipe for forming a mono diameter wellbore casing, comprising:

an expansion cone connected to the drill pipe;

an expandable bottom packer coupled to and below the expansion cone;

an expandable tubular member supported by the drill pipe above the expansion cone for insertion into the wellbore;

an anchor device supported by the drill pipe within the expandable tubular member for releasably gripping the expandable tubular member;

an actuator coupled between the anchor and the expansion cone for moving the cone partially into the expandable tubular member to form a first expanded portion of the expandable tubular member;

a set mechanism coupled between the expansion cone and the expandable bottom packer for expanding the expandable bottom packer and sealingly setting the expanded expandable bottom packer in the first expanded portion of the expandable tubular member; and

a release mechanism coupled between the expansion cone and the expandable bottom packer for releasing the expandable bottom packer from the expansion cone such that fluid pumped into the expandable tubular member between the expansion cone and the expandable bottom packer will force the expansion cone through the expandable tubular member and will thereby expand a second portion of the expandable tubular member.

6. The apparatus of claim 5, further comprising a closable valve for selectively passing fluidic materials through the expandable bottom packer into the wellbore.

7. The apparatus of claim 5, wherein the expandable bottom packer comprises a drillable packer.

8. The apparatus of claim 5, wherein the expandable bottom packer comprises a retrievable packer.

9. A bottom plug for use in connection with an apparatus for forming a mono diameter wellbore casing, the apparatus of the type using an expandable tubular member carried into the wellbore on a tubular support and expanded with an expansion device connected to the tubular support, the bottom plug comprising:

an expandable packer attached below the expansion device;

a packer setting mechanism coupled between the expansion device and the expandable packer for expanding the expandable packer and sealingly setting the expandable packer in an expanded portion of the expandable tubular member; and

a release mechanism coupled between the expansion device and the expandable packer for releasing the expandable bottom packer from the expansion device so that fluid pumped into the expandable tubular member between the expansion device and the sealed and set

expandable bottom packer will facilitate forcing the expansion device into and through the expandable tubular member to expand the expandable tubular member.

10. The bottom plug of claim 9, wherein the expansion device comprises an expansion cone.

11. The bottom plug of claim 10, wherein the expansion cone comprises an adjustable diameter expansion cone.

12. The bottom plug of claim 9, wherein the expansion device comprises a rotary expansion device.

13. The bottom plug of claim 12, wherein the rotary expansion device comprises an adjustable diameter rotary expansion device.

14. The bottom plug of claim 9, wherein the expansion device comprises a compliant expansion device.

15. The bottom plug of claim 14, wherein the compliant expansion device comprises an adjustable diameter compliant expansion device.

16. The bottom plug of claim 9, wherein the expansion device comprises a hydroforming expansion device.

17. The bottom plug of claim 16, wherein the hydroforming expansion device comprises an adjustable expansion diameter hydroforming device.

18. A method for forming a mono diameter wellbore casing, comprising
connecting an expansion cone to a tubular support;
coupling an expandable bottom packer to and below the expansion cone;
supporting an expandable tubular member with the tubular support at position above the expansion cone;
inserting the expandable tubular member into the wellbore;
expanding a first portion of the expandable tubular member with the expansion cone;

sealingly setting the expanded expandable bottom packer in the first expanded portion of the expandable tubular member; and

releasing the expandable bottom packer from the expansion cone;

pumping fluid into the expandable tubular member between the expansion cone and the set and expanded expandable bottom packer to force the expansion cone through the expandable tubular member to expand a second portion of the expandable tubular member.

19. The method for forming a mono diameter wellbore casing of claim 18, wherein expanding the first portion of the expandable tubular member with the expansion cone further comprises gripping the expandable tubular member with an anchor device supported by the drill pipe; coupling an actuator between the anchor and the expansion cone; and moving the expansion cone with the actuator partially into the expandable tubular member to form the first expanded portion of the expandable tubular member.

20. A method for forming a mono diameter wellbore casing, comprising connecting an expansion device to a tubular support; coupling an expandable bottom packer to and below the expansion device; supporting an expandable tubular member with the tubular support at position above the expansion device; inserting the expandable tubular member into the wellbore; expanding a first portion of the expandable tubular member with the expansion device; sealingly setting the expanded expandable bottom packer in the first expanded portion of the expandable tubular member; and releasing the expandable bottom packer from the expansion device; pumping fluid into the expandable tubular member between the expansion device and the set and expanded expandable bottom packer to facilitate forcing the expansion device through the expandable tubular member to expand a second portion of the expandable tubular member.

21. The method for forming a mono diameter wellbore casing of claim 20, wherein expanding the first portion of the expandable tubular member with the expansion device further comprises: gripping the expandable tubular member with an anchor device supported by the drill pipe; coupling an actuator between the anchor and the expansion cone; and

moving the expansion device with the actuator partially into the expandable tubular member to form the first expanded portion of the expandable tubular member.

22. The method for forming a mono diameter wellbore casing of claim 20, wherein expanding the first portion of the expandable tubular member with the expansion device further comprises expanding using an adjustable expansion device.

23. The method for forming a mono diameter wellbore casing of claim 20, wherein expanding the first portion of the expandable tubular member with the expansion device further comprises expanding using a rotary expansion device.

24. The method for forming a mono diameter wellbore casing of claim 20, wherein expanding the first portion of the expandable tubular member with the expansion device further comprises expanding using a compliant expansion device.

25. The method for forming a mono diameter wellbore casing of claim 20, wherein expanding the first portion of the expandable tubular member with the expansion device further comprises expanding using a hydroforming expansion device.

26. A method for forming a mono diameter wellbore casing, comprising
connecting an expansion cone to a tubular support;
supporting an expandable tubular member with the tubular support at a position above the expansion cone;
inserting the expandable tubular member into the wellbore;
expanding a first portion of the expandable tubular member with the expansion cone;
sealing off the first expanded portion of the expandable tubular member; and
pumping fluid into the expandable tubular member between the expansion cone and the sealed off first expanded portion of the expandable tubular member to force the expansion cone through the expandable tubular member to expand a second portion of the expandable tubular member.

27. The method of claim 26, wherein expanding the first portion of the expandable tubular member with the expansion cone further comprises

gripping the expandable tubular member with an anchor device supported by the drill pipe;
coupling an actuator between the anchor and the expansion cone; and
moving the expansion cone with the actuator partially into the expandable tubular member
to form the first expanded portion of the expandable tubular member.

28. A method for forming a mono diameter wellbore casing, comprising:
connecting an expansion device to a tubular support;
supporting an expandable tubular member with the tubular support at position above the
expansion device;
inserting the expandable tubular member into the wellbore;
expanding a first portion of the expandable tubular member with the expansion device;
sealingly off the first expanded portion of the expandable tubular member; and
pumping fluid into the expandable tubular member between the expansion device and the
sealed off first expanded portion of the expandable tubular member to facilitate
forcing the expansion device through the expandable tubular member to expand a
second portion of the expandable tubular member.
29. The method of claim 28, wherein expanding the first portion of the expandable tubular
member with the expansion device further comprises:
gripping the expandable tubular member with an anchor device supported by the drill pipe;
coupling an actuator between the anchor and the expansion cone; and
moving the expansion device with the actuator partially into the expandable tubular
member to form the first expanded portion of the expandable tubular member.
30. The method of claim 28, wherein expanding the first portion of the expandable tubular
member with the expansion device further comprises expanding using an adjustable expansion
device.
31. The method of claim 28, wherein expanding the first portion of the expandable tubular
member with the expansion device further comprises expanding using a rotary expansion device.

32. The method of claim 28, wherein expanding the first portion of the expandable tubular member with the expansion device further comprises expanding using a compliant expansion device.
33. The method of claim 28, wherein expanding the first portion of the expandable tubular member with the expansion device further comprises expanding using a hydroforming expansion device.
34. A system for forming a mono diameter wellbore casing, comprising
means for connecting an expansion cone to a tubular support;
means for coupling an expandable bottom packer to and below the expansion cone;
means for supporting an expandable tubular member with the tubular support at position
above the expansion cone;
means for inserting the expandable tubular member into the wellbore;
means for expanding a first portion of the expandable tubular member with the expansion
cone;
means for sealingly setting the expanded expandable bottom packer in the first expanded
portion of the expandable tubular member;
means for releasing the expandable bottom packer from the expansion cone; and
means for pumping fluid into the expandable tubular member between the expansion
cone and the set and expanded expandable bottom packer to force the expansion
cone through the expandable tubular member to expand a second portion of the
expandable tubular member.
35. The system of claim 34, wherein means for expanding the first portion of the expandable tubular member with the expansion cone further comprises
means for gripping the expandable tubular member with an anchor device supported by
the drill pipe;
means for coupling an actuator between the anchor and the expansion cone; and
means for moving the expansion cone with the actuator partially into the expandable
tubular member to form the first expanded portion of the expandable tubular
member.

36. A system for forming a mono diameter wellbore casing, comprising
means for connecting an expansion device to a tubular support;
means for coupling an expandable bottom packer to and below the expansion device;
means for supporting an expandable tubular member with the tubular support at position
above the expansion device;
means for inserting the expandable tubular member into the wellbore;
means for expanding a first portion of the expandable tubular member with the expansion
device;
means for sealingly setting the expanded expandable bottom packer in the first expanded
portion of the expandable tubular member;
means for releasing the expandable bottom packer from the expansion device; and
means for pumping fluid into the expandable tubular member between the expansion
device and the set and expanded expandable bottom packer to facilitate forcing
the expansion device through the expandable tubular member to expand a second
portion of the expandable tubular member.
37. The system of claim 36, wherein means for expanding the first portion of the expandable
tubular member with the expansion device further comprises:
means for gripping the expandable tubular member with an anchor device supported by
the drill pipe;
means for coupling an actuator between the anchor and the expansion cone; and
means for moving the expansion device with the actuator partially into the expandable
tubular member to form the first expanded portion of the expandable tubular
member.
38. The system of claim 36, wherein means for expanding the first portion of the expandable
tubular member with the expansion device further comprises means for expanding using an
adjustable expansion device.
39. The system of claim 36, wherein means for expanding the first portion of the expandable
tubular member with the expansion device further comprises means for expanding using a rotary
expansion device.

40. The system of claim 36, wherein means for expanding the first portion of the expandable tubular member with the expansion device further comprises means for expanding using a compliant expansion device.

41. The system of claim 36, wherein means for expanding the first portion of the expandable tubular member with the expansion device further comprises means for expanding using a hydroforming expansion device.

42. A system for forming a mono diameter wellbore casing, comprising
means for connecting an expansion cone to a tubular support;
means for supporting an expandable tubular member with the tubular support at a position above the expansion cone;
means for inserting the expandable tubular member into the wellbore;
means for expanding a first portion of the expandable tubular member with the expansion cone;
means for sealing off the first expanded portion of the expandable tubular member; and
means for pumping fluid into the expandable tubular member between the expansion cone and the sealed off first expanded portion of the expandable tubular member to force the expansion cone through the expandable tubular member to expand a second portion of the expandable tubular member.

43. The system of claim 42, wherein means for expanding the first portion of the expandable tubular member with the expansion cone further comprises
means for gripping the expandable tubular member with an anchor device supported by the drill pipe;
means for coupling an actuator between the anchor and the expansion cone; and
means for moving the expansion cone with the actuator partially into the expandable tubular member to form the first expanded portion of the expandable tubular member.

44. A system for forming a mono diameter wellbore casing, comprising:
means for connecting an expansion device to a tubular support;
means for supporting an expandable tubular member with the tubular support at position

above the expansion device;
means for inserting the expandable tubular member into the wellbore;
means for expanding a first portion of the expandable tubular member with the expansion device;
means for sealing off the first expanded portion of the expandable tubular member; and
means for pumping fluid into the expandable tubular member between the expansion device and the sealed off first expanded portion of the expandable tubular member to facilitate forcing the expansion device through the expandable tubular member to expand a second portion of the expandable tubular member.

45. The system of claim 44, wherein means for expanding the first portion of the expandable tubular member with the expansion device further comprises:

means for gripping the expandable tubular member with an anchor device supported by the drill pipe;
means for coupling an actuator between the anchor and the expansion cone; and
means for moving the expansion device with the actuator partially into the expandable tubular member to form the first expanded portion of the expandable tubular member.

46. The system of claim 44, wherein means for expanding the first portion of the expandable tubular member with the expansion device further comprises means for expanding using an adjustable expansion device.

47. The system of claim 44, wherein means for expanding the first portion of the expandable tubular member with the expansion device further comprises means for expanding using a rotary expansion device.

48. The system of claim 44, wherein means for expanding the first portion of the expandable tubular member with the expansion device further comprises means for expanding using a compliant expansion device.

49. The system of claim 44, wherein means for expanding the first portion of the expandable tubular member with the expansion device further comprises means for expanding using a hydroforming expansion device.